PTI-213

'286 HDC
Disk Drive Controller Card
User Manual

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Contents

Introduction **1**

Features **2-4**

Card layout **5**

Card setup **6-8**
- Interface connectors 6
- Jumper settings 7
- I/O port selection 8

Installation **9-10**

Appendices **11-14**
- A (interface specifications) 11
- B (HDD format procedure) 14

Introduction

You can rest assured of having made a wise choice in buying the PTI-213 286 HDC Card, Disk Drive Controller (DDC), to extend the data I/O functions of your IBM PC/AT® or compatible computer. The PTI-213 is a high performance storage controller designed as an interface between your PC/AT or compatible computer and the floppy/Winchester disk drives.

The PTI-213 utilizes the Western Digital Chips Set to obtain the smallest possible board size.

The clear, well-illustrated instructions in this manual ensure that even if you are a newcomer to the computer world, you will have the PTI-213 286 HDC Card installed and running with the minimum of effort.

Features

The PTI-213 286 HDC Card accepts and executes all link read/write commands issued by the main system.

Floppy disk interface:
Controls up to two floppy disk drives with any combination of 360K, 720K, I.2MB and 1.4MB formatted.

Hard disk interface:
Controls up to two Winchester disk drives with any combination of up to 16 heads and 2048 cylinders.

The PTI-213 incorporates the highly integrated WD2010 Winchester disk controller and error detection device; WD1015 single chip microprocessor: WD11C00C buffer manager and controller; WD10C20B Winchester data separator and a WD37C65 single chip floppy disk controller.

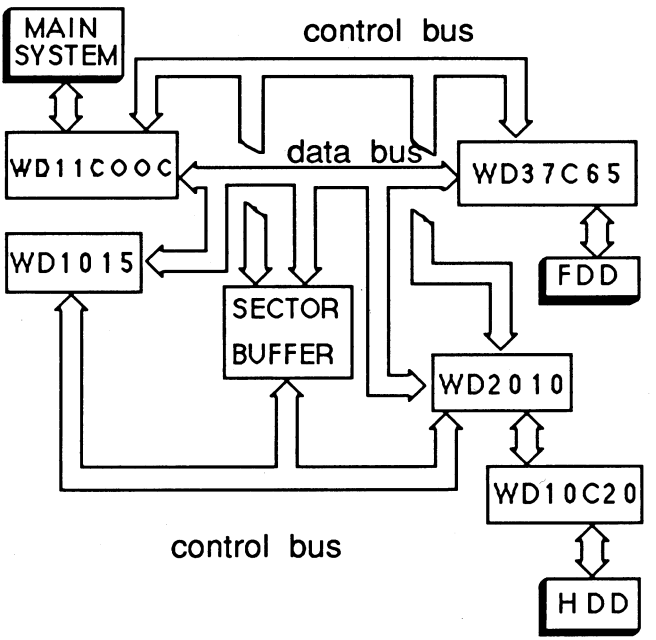
The WD1015 microprocessor receives all the commands from the main system and controls the activity of the hard disk drives.

The WD2010 WDC controls all the data transfer between the sector buffer and drives. It also performs sector read/write, implied and buffer seek commands. All Winchester commands are executed through the task files of the chip. It also handles the error checking and correction while error occurs.

The WD10C20B single chip Winchester data separator provides an analog, phase-locked loop to synchronize the read data from the hard disk drives, requiring no adjustment and containing all the data separation and write precompensation circuitry in a single device.

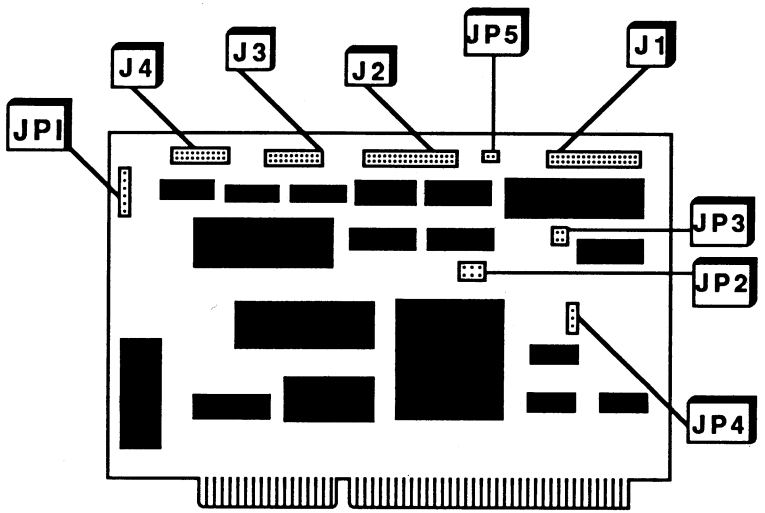
The PTI-213 286 HDC Card incorporates the WDC37C65 single chip floppy drive controller and special supporting circuitry to perform the floppy disk read/write through a programmable data rate, supporting 250K bps, 300K bps and 500K bps data rates.

The inter-relationship between these components is shown in the block diagram below:



Card layout

The figure below shows the layout of the PTI-213 286 HDC Card.



Card setup

Interface connectors

The PTI-213 has seven interface connectors*:

- 62-pin card edge connector for main system interfacing.
- 36-pin card edge connector for main system interfacing.
- Hard Disk Drive 2 data cable connector (J4).
- Hard Disk Drive 1 data cable connector (J3).
- Hard Disk Drive Control cable connector (J2).
- Floppy Disk Drive Data/Control cable connector (J1).
- External LED indicator connector (JP1).

*** See Appendix A for the specifications of these interfaces.**

Jumper settings

Floppy disk drive settings

You may wish to disable the floppy disk facility of your PTI-213 and connect another floppy disk control card. To do this, open jumpers JP3 and JP5 as shown below:

JP3 and JP5 both short enable floppy	JP3 and JP5 both open disable floppy
JP3 JP5	JP3 JP5

Jumpers JP3 & JP5 settings

As there are two types of 3 1/2" 1.44MB floppy disk drives (one for the AT, another for the PS/2)*, you can select either one or the other by setting jumper JP4 as shown below:

***Note:** the normal type of FDD is the AT.

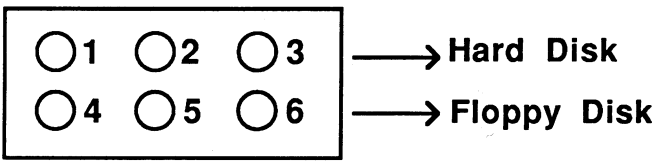
Select AT-Type FDD	Select PS/2-Type FDD

JP4 jumper settings

I/O port selection

The PTI-213 286 HDC Card contains 13 read/write task file registers, which are mapped into either a primary or secondary I/O address.

All disk data, control and status information pass between these registers and the main system. The jumper JP2 of the PTI-213 selects the primary or secondary address. This allows two PTI-213 286 HDC Cards to function in the same main system if the BIOS of the system supports this kind of operation. The appropriate settings of JP2 are shown in the figures below:



I/O Port Address	Primary	Secondary
Hard Disk Interface	1 2 3 170~177 (HEX)	1 2 3 1F0~1F7 (HEX)
Floppy Disk Interface	4 5 6 390~37F (HEX)	4 5 6 3F0~3F7 (HEX)

Installation

Note: A hard disk must be formatted before it can be read from or written to. If your hard disk requires this, refer to **Appendix B** for notes on procedure.

PTI -213 installation

First ensure that the power to the system is turned **off** and that your hard disk is formatted (see **Appendix B** if necessary).

Unpack the PTI-213 286 HDC Card. Set the jumpers correctly, connect the flat cable to the floppy disk drives and hard disk drives, then insert the PTI-213 into a 16-bit I/O slot in your computer.

Systems vary and therefore so will the exact procedure for installation. We shall use an IBM PC/AT® with a Seagate ST225® Type 2 Hard disk drive as an example.

Insert the Advance Diagnostics diskette into drive "A" and boot the system.

Select the "SET UP" option and set the system configuration according to the installed devices. In our example we must add a Type 2 Hard disk drive to the system configuration through the set-up procedure.

Select the "SYSTEM CHECKOUT" option. Respond to the configuration list, then select the "RUN TESTS ONE TIME" option from the next menu.

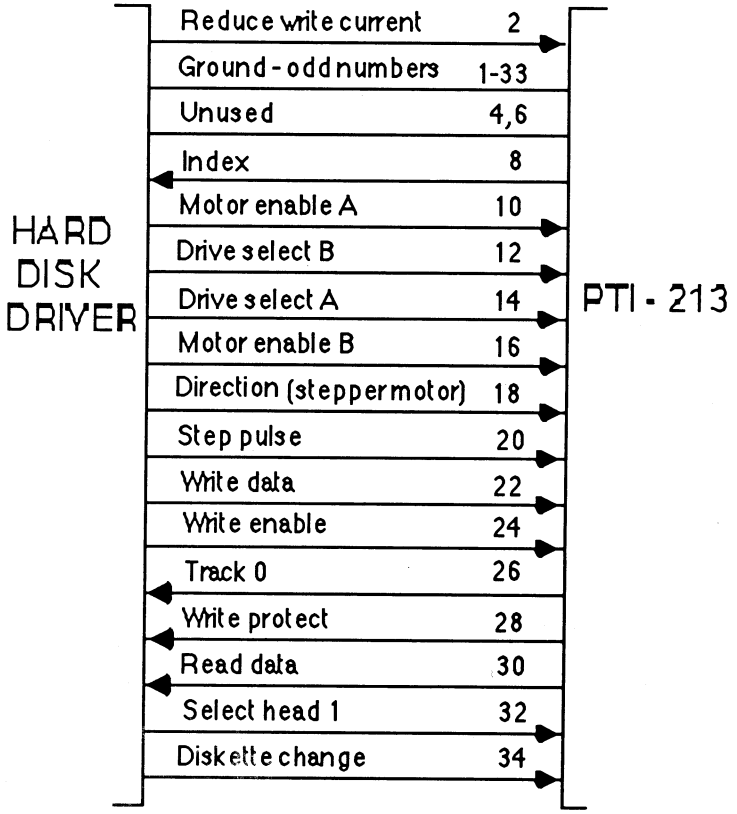
Select option "17-1 FIXED DISK DRIVE(S) AND ADAPTER" to enter the "FIXED DISK DIAGNOSTIC MENU". Type in (7,C) to enter "FORMAT MENU" to preformat Drive "C".

Select "UNCONDITIONAL FORMAT", type in (2,C).

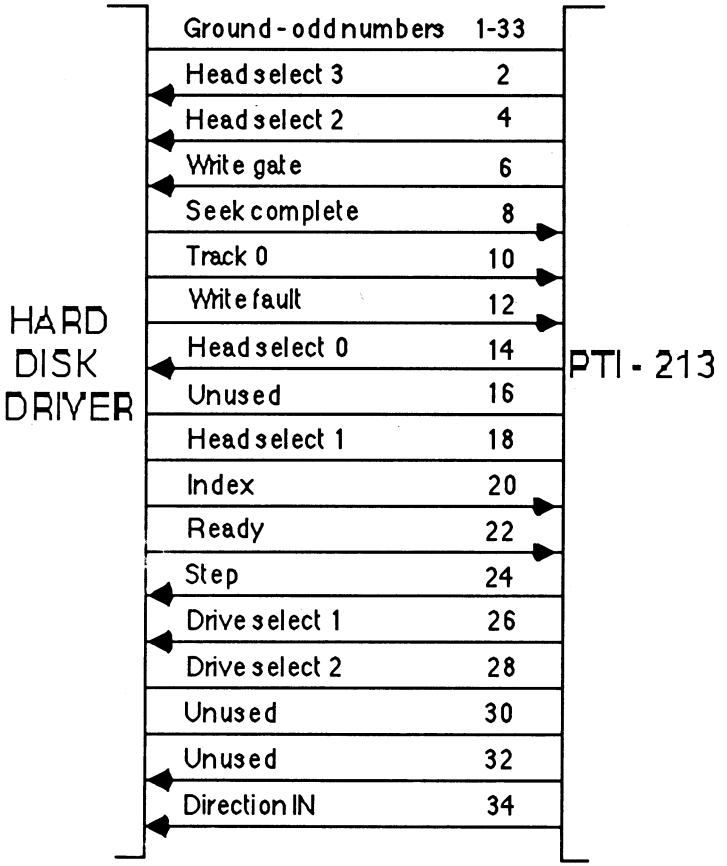
Type in the defect information supplied by the hard disk manufacturer. Format with entered defects.

After "FORMAT COMPLETED proceed with FDISK and DOS® Format according to the DOS® manual.

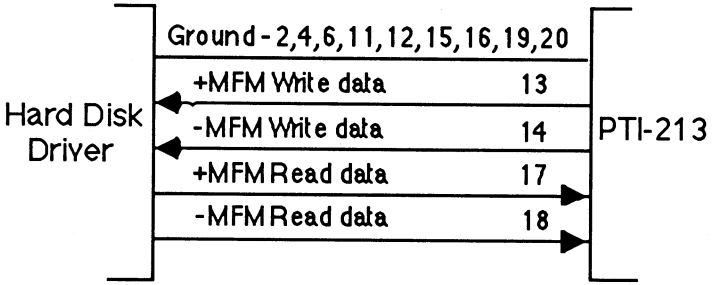
Appendix A



Interface Signals - J1



Interface Signals - J2



Interface Signals - J3 & J4

Appendix B

Hard disk drive format

1. Preformat

Normally, the preformat utility is supplied by the system manufacturers. IBM® provide this utility through the IBM® Advanced Diagnostics diskette. Others store this utility within their DOS® diskette. Some BIOS support this function.

2. Partition

This process creates the DOS® partitioning on a preformatted hard disk drive. The DOS® command "FDISK" handles this partitioning process.

3. Format

The DOS® command "FORMAT" verifies the media and moves the system file onto the hard disk drive. The complete command should be typed in as:

A >FORMAT C:/S